REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Upon entry of this Amendment, claims 1-10 are pending in the application. In response to the Office Action (Paper No. 9), Applicant respectfully submits that the pending claims define patentable subject matter.

The proposed drawing corrections filed on March 4, 2002 has been disapproved by the Examiner because the Examiner maintains that the original disclosure does not support the showing of a rotational detector connected to the control unit and the rotational detector has not been assigned a numerical reference label. Applicant respectfully submits that original specification supports the illustration of the rotational speed detector connected to the control unit in Figure 1. In particular, the specification (page 8, lines 2-4) states that "the control unit 9 is configured such that a voltage applied to the high power load is made to correspond to a detected rotating speed" and pages 8-9 describe how the control unit increases the power of the alternator by changing the output voltage of the alternator in response to the rotating speed when the alternator supplies power to the high power load. Further, original claim 4 recites that "said output voltage of said alternator changes in response to said rotating speed detected by a rotating speed detector".

Along with this Amendment, Applicant is Applicant is submitting a Proposed Drawing Correction wherein the rotational speed detector of Figure 1 is provided with a numerical reference label ("13"). Further, the specification has been amended to refer to the rotational speed detector. Accordingly, the Examiner is requested to remove the objection to the drawings.

Claims 5, 6 and 10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. By this Amendment, Applicant has amended claims 5 and 6 to improve clarity.

With regards to claim 10, the Examiner maintains that it is unclear (1) how the gradient temperature is related to suppressing the temperature rise of the alternator, (2) how such suppression of temperature creates a negative gradient, and (3) what is meant by the term "negative". As discussed in the specification on page 13, lines 6-7, "a temperature rise of the 3-phase alternator 1 is suppressed by the stepping-down DC/DC converter 12 having negative gradient temperature characteristics." One of skill in the art would recognize from this statement that, the DC/DC converter 12 has a negative gradient output voltage/temperature characteristic such that the output voltage of the DC/DC converter 12 is reduced as the temperature of the DC/DC converter 12 increases. Further, the DC/DC converter 12 is disposed so as to receive the change of temperature of the alternator 1. When the temperature of the alternator 1 increases, the output voltage of the DC/DC converter 12 is reduced. Depending on the reduction of the output voltage of the DC/DC converter 12, the field current provided to the field coil 3 is reduced and the temperature rise of the alternator 1 is thus suppressed.

Accordingly, the Examiner is requested to remove the § 112, second paragraph, rejection of claims 5, 6 and 10.

Claims 1, 3 and 7-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaneyuki (USP 5,418,401) in view of Glennon (USP 5,930,134). Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaneyuki in view of Glennon and Taniguchi et al. (USP 5,719,484, hereafter "Taniguchi '484"). Claims 4-6 and 10 are rejected under 35 U.S.C. §

103(a) as being unpatentable over Kaneyuki in view of Glennon and Taniguchi et al. (USP 5,726,559, hereafter "Taniguchi '559"). Applicant respectfully submits that the claimed invention would not have been rendered obvious in view of the combined references.

The present invention is directed to a vehicle electrical power supply system for supplying power to both a high power load, such as a blower motor or windshield heater, and a conventional load, such as a battery, using a conventional alternator. In a first embodiment of the present invention shown in Figure 1, the power supply system comprises an alternator 1 including an armature assembly 2 and a field coil 3, a regulator 4, a battery 5 and a high power load 7. A power relay 8 switches power supplied from the alternator 1 to the battery 5 or the high power load 7. A control unit 9 detects an on/off state of a switch 10 for supplying power to the high power load 7, and switches the power relay 8 to the battery 5 for charging or the high power load 7. The control unit 9 also controls the regulator 4, whereby an output voltage of the alternator 1 is switched to a low charging voltage for the battery 5 or a high voltage for the high power load 7. That is, the regulator 4 operates a voltage controller for controlling a field current of the field coil 3 in order to change the output voltage of the alternator 1. A stepping-up DC/DC converter 6 is provided for stepping up a voltage of the battery 5 and supplying the stepped-up voltage to the field coil 3. In particular, the stepping-up DC/DC converter 6 steps up the battery voltage by a factor of 1.2 to 2.0 in order to increase the field voltage of the field coil 3 and thereby increase a maximum output power of the alternator 1.

Independent claims 1 and 8 recite, in part, an alternator having an armature winding and a field coil for supplying a power to both a high power load and a battery, a stepping-up DC/DC

converter for stepping up a voltage of said battery and applying a stepped-up voltage to said field coil, a voltage control means for controlling an output voltage of said alternator by controlling a current of said field coil. As the Examiner correctly notes, Kaneyuki does not teach or suggest a stepping-up DC/DC converter for stepping up a voltage of the battery and applying a stepped-up voltage to the field coil (of the alternator). Rather, Kaneyuki discloses that the battery is directly connected to the field coil. However, the Examiner asserts that "Glennon discloses for the purpose of improving the reliability of prime movers that it is well known in the art of prime movers to step-up DC/DC converter and apply the voltage to the field coils (column 1, lines 25-29 & figures 1, 3)."

With regards to independent claims 1 and 8, Applicant respectfully submits that it is quite clear that Glennon does not teach or suggest a stepping-up DC/DC converter for stepping up a voltage of the battery and applying a stepped-up voltage to the field coil. In particular, Glennon discloses applying a stepped-up voltage to the armature winding of an electrical generator rather than the field winding or coil (e.g., see claim 1 of Glennon). As shown in Figures 1-3 of Glennon, an electrical generator 14 including a first step-up converter 60, a second power converter 62 coupled to the first step-up converter 60, and a main generator portion 44 including a three-phase armature winding 54 and a field winding 48. The AC output power of the generator 14 is supplied from the armature winding 54 to line contactors 18 via feeders 16. However, in a starting mode, the armature winding 54 is supplied with DC power from a battery 26. The exciter armature winding 52 excites the main field winding 48 through a three-phase rectifier of an exciter portion 42. The first step-up converter 60 converts DC battery power into a first

alternating waveform. The second converter 62 provides to the armature winding 54 a second alternating waveform comprising a series of pulses selected from the first alternating waveform such that the generator 14 is operated as a motor to supply motive starting power to the prime mover.

Similarly, Applicant respectfully submits that Taniguchi '484 and Taniguchi '559 do not teach or suggest a stepping-up DC/DC converter for stepping up a voltage of the battery and applying a stepped-up voltage to the field coil, as recited in claims 1 and 8.

Accordingly, Applicant respectfully submits that independent claims 1 and 8, as well as dependent claims 2-7, 9 and 10, should be allowable because the applied references do not teach or suggest all of the claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

The paragraph bridging pages 7 and 8:

The high power load 7 is a load such as a blower motor or a windshield heater driven directly by a high voltage of the 3-phase alternator 1. A power relay 8 switches a power supplied from the 3-phase alternator 1 to the battery 5 for charging or to the high power load 7. A control unit 9 detects [a] an on/off state of a switch 10 for supplying power to the battery 5 for charging or to the high power load 7. Moreover, the control unit 9 is configured to command the regulator 4, whereby an output voltage of the 3-phase alternator 1 is switched to a low charging voltage for the battery 5 or a high voltage for the high power load 7. In addition, [although not shown in fig. 1,] the control unit 9 is configured such that voltage applied to the high power load is made to correspond to a detected rotating speed of the 3-phase alternator 1 detected by a rotating speed detector 13, and that an output of the 3-phase alternator 1 is suppressed by detecting a temperature of the field coil 3.

IN THE CLAIMS:

The claims are amended as follows:

5. (Twice Amended) The electrical power supply system for the automotive vehicle according to claim l, wherein said voltage control means controls said [field] current of said [alternator] field coil based on a detected temperature of said field coil.

6. (Twice Amended) The electrical power supply system for the automotive vehicle according to claim l, wherein said voltage control means controls said [field] current of said [alternator] field coil based on [an inferred] a temperature of said field coil inferred from said field current of said [alternator] field coil.